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FOOD TABLES

Compiled particularly for use in treatment of Diabetes Mellitus.

By

G. A. HARRISON, B.A., M.B., B.Ch. (Cantab.),

Biochemist, The Hospital for Sick Children, Great Ormond Street;
late Biochemist, King's College Hospital;

AND

R. D. LAWRENCE, M.A., M.D. (Aberd.).

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SECOND EDITION,
Revised and Enlarged.

London:
Printed and Published by H. B. SKINNER & Co.,
124/6 Denmark Hill, S.E. 5.

1924.

Price 2s., post free 2s. 2d.

BOSTON MEDICAL
OCT 16 1924
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First Edition, October, 1921.

Second Edition, January, 1924.

Preface to Second Edition.

In the course of work upon diabetes mellitus, we have felt for some time the need for *simple*, yet accurate, diet tables. Both sisters and patients have frequently said how difficult they find the task of working out diets with the usual tables, which give the content of carbohydrate protein and fat per ounce, or per 100 grammes, of food. It is our practice and that of many physicians to order daily so many grammes of the three food-stuffs, indicating the type of food to be given, but leaving the sister or patient to work out the details. In this way the patient receives a varied diet, and the important questions of personal tastes, expense, and of what foods are in season, are dealt with by those most competent to judge. With a little practice and careful weighing, the following tables make it easy to work out a very varied yet accurate diet. Accuracy is more than ever important now that insulin, which has to be balanced carefully against the diet, has been introduced.

The figures in the tables are an average from all the main sources of food analyses, and represent the parts of the food utilized by the body as far as these are known. They are accurate to the nearest gramme or cubic centimetre, and, in ounces to the nearest convenient fraction, erring, if anything, on the side of safety to the patient. It has been difficult in some instances to reconcile the very variable figures given by different authors, especially as regards cooked foods, where the analyses are often few in number. The analyses of foods as cooked in Britain require careful revision.

There is nothing original in this book. We have merely inverted the values given in standard works, an idea which originated from Dr. O. Leyton's book. The sources of compilation are given overleaf. After the tables is given a short explanation of their use and other practical points. With their aid the practitioner should not find it too laborious to treat his patients accurately on modern lines, and the patient should find it easy to vary his diet within wide limits.

G. A. H.
R. D. L.

LONDON.

January, 1924.

SOURCES FROM WHICH COMPILED.

(a) "Bulletin 28, U.S. Department of Agriculture." ATWATER and BRYANT.

(b) "Foods, Their Composition and Analysis." BLYTH.

(c) "Diabetic Dieting and Cookery." P. J. CAMMIDGE.

(d) "Food and Principles of Dietetics." R. HUTCHISON.

(e) "Modern (Allen) Treatment of Diabetes Mellitus." O. LEYTON.

(f) "Food Values." E. A. LOCKE.

(g) "Analyses and Energy Values of Foods." R. H. A. PLIMMER.

(h) "Foods, Their Origin, Composition and Manufacture." W. TIBBLES.

(i) "Foods for Diabetics." R. A. WARDALL, J. Amer. Med. Assoc., Vol. LXIX., page 22.

Carbohydrate Foods (C.)

(VEGETABLES, FRUIT, BREAD, MILK, &c.).

Articles of diet marked with an * are forbidden for diabetics unless specially permitted by the physician.

5 GRAMMES OF CARBOHYDRATE are contained in—

	Gm.	Oz.	Remarks (how weighed, &c.).	And these amounts also contain grammes of— P.	F.
ALMONDS ...	*29*	1	Without shells	6	16
APPLES ...	*45*	1½	With skin	0	0
	38	1⅓	Without skin	0	0
	19	⅔	Baked	0	0
	71	2½	Stewed, without sugar ...	0	0
	8	¼	Apple rings, dried	0	0
APRICOTS ...	*36*	1¼	Fresh, with stones	0	0
	28	1	Tinned	0	0
	10	⅓	Dried	½	0
	71	2½	Stewed, without sugar ...	0	0
*ARROWROOT...	*5*	⅙	Uncooked	0	0
ARTICHOKE ...	*111*	4	Boiled once	½	0
ASPARAGUS ...	*170*	6	Fresh, boiled once	3½	0
	170	6	Tinned	3½	0
BANANA ...	*36*	1¼	With skin	0	0
	22	¾	Without skin	0	0
BEANS ...	*33*	1¼	Broad, boiled once	1½	0
	85	3	Butter ,, ...	2	0
	200	7	French ,, ...	1½	0
	20	⅔	Haricot ,, ...	1½	0
	200	7	Scarlet Runner, boiled once	2½	0
BEETROOT ...	*77*	2¾	Boiled once	1	0

5 GRAMMES OF CARBOHYDRATE

are contained in—

	Gm.	Oz.	Remarks (how weighed, &c.).	And these amounts also contain grammes of— P.	F.
*Benger's Food	6	⅕	As purchased	½	0
Bilberry ...	86	3	,, ...	0	0
*Biscuit ...	7	¼	Average, unsweetened ...	1	0
Blackberries	55	2	As purchased	½	0
Blackcurrants	50	1¾	,, ...	1	0
*Bread ...	10	⅓	Average white	1	0
	11	⅓	Average brown	½	0
Brussels Sprouts	143	5	Boiled once	2	0
Buttermilk	100 c.c.	3½	... ...	3	1
Cabbage ...	250	8¾	Boiled in two waters ...	1½	0
	166	5¾	Boiled once	1½	0
Calf's Foot Jelly	28	1	As purchased	1	0
Carrots ...	125	4½	Boiled once	½	0
Cauliflower	250	8¾	Boiled once	1½	0
Celery ...	143	5	Raw, edible portion ...	1	0
	250	8¾	Boiled in two waters ...	2	0
Cherries ...	42	1½	Including stones, raw ...	½	0
	71	2½	Stewed without sugar ...	0	0
Chicory ...	156	5½	Raw	2	0
*Chocolate ...	12	⅓	Average	½	2
*Cocoa ...	12	⅓	Average	3	4
Cocoanut ...	50	1¾	Fresh, edible portion ...	3	25
	16	½	Dried ,, ...	1	9
*Cornflour ...	6	⅕	Uncooked	0	0
Cranberries	50	1¾	As purchased	0	0
Cream	...111 c.c.	3¾	Average thin, hand skimmed	2½	20
Cress ...	200	7	Uncooked	2½	1
Cucumber ...	142	5	Raw, without skin	1	0
	166	5½	Raw, with skin	1	0
	250	8¾	Boiled once	½	0
*Currants ...	8	¼	Dried	0	0
*Custard Powder	6	⅕	As purchased	0	0

5 GRAMMES OF CARBOHYDRATE

are contained in—

	Gm.	Oz.	Remarks (how weighed, &c.).	And these amounts also contain grammes of— P.	F.
DAMSONS ...	*62*	2¼	Raw, with stones	0	0
DANDELION ...	*62*	2¼	Boiled once	1½	½
*DATES ...	*7*	¼	Dried	0	0
*EGG POWDER	*10*	⅓	As purchased	½	0
ENDIVE ...	*166*	5¾	Raw, edible portion ...	2½	0
FIGS	*33*	1¼	Green, as purchased ...	½	0
	8	¼	*Dried...	½	0
	12	⅓	*Stewed	0	0
*FORCE ...	*7*	¼	As purchased	½	0
GOOSEBERRIES	*71*	2½	Raw	½	0
GRAPE FRUIT	*114*	4	Weighed whole	½	0
	60	2	Edible part	½	0
*GRAPENUTS ...	*6*	⅕	As purchased	0	0
GRAPES ...	*33*	1	Fresh	½	0
GREENGAGES	*40*	1½	As purchased	0	0
GREENS ...	*250*	8¾	Average mixed, boiled once	1½	½
	166	5¾	Beet Tops ,,	3	0
	200	7	Cabbage Sprouts ,,	2½	0
	62	2¼	Dandelion ,,	1½	½
	166	5¾	Kale, Curly ,,	3	0
	166	5¾	Turnip Tops ,,	1½	0
*HONEY ...	*6*	⅕	As purchased	0	0
*HORLICK'S MALTED MILK	*7*	¼	,, ...	1	½
HORSERADISH	*45*	1½	Raw	½	0
*JAM	*8*	¼	Average	0	0
KALE... ...	*166*	5¾	Boiled once	3	0
LEEKS ...	*85*	3	,, ...	1½	0
LEMON ...	*166*	5¾	Edible portion	1½	0
	125 c.c.	4½	Juice	0	0
LETTUCE ...	*171*	6	Raw, whole...	2½	½
	250	8¾	Boiled once	2	½
MACARONI ...	*31*	1	,, ...	1	½
	7	¼	Raw	1	0

5 GRAMMES OF CARBOHYDRATE

are contained in—

	Gm.	Oz.	Remarks (how weighed, &c.).	And these amounts also contain grammes of— P.	F.
*Marmalade	*6*	⅕	Ordinary	0	0
	166	5¾	Diabetic, Callard's, Keiller's, &c.	0	0
Marrow, Vegetable	*100*	3½	Green, boiled once... ...	½	0
	200	7	Yellow ,, ...	½	0
	250	8¾	Yellow, boiled twice ...	½	0
*Mellin's Food	*6*	⅕	As purchased	½	0
Melon ...	*171*	6	Including skin	½	0
	71	2½	Edible portion	0	0
Milk ...	*...100* c.c.	3½	Fresh	3½	3½
	28 c.c.	1	Condensed, unsweetened ...	3	3
	14	½	Dried	3½	3½
	100 c.c.	3½	Skimmed	4	½
Mulberries	*50*	1¾	As purchased	½	0
Mushrooms...			See list of "Extras" (page 25).		
Mustard and Cress	*200*	7	Raw	2½	1
Nectarines...	*33*	1	As purchased	0	0
Nuts	*80*	2¾	Brazil, without shell ...	14½	54
	10	⅓	*Chestnut ,, ,, ...	1	½
	42	1½	Hazel ,, ,, ...	6	27
	23	¾	*Peanuts ,, ,, ...	6	9
	45	1½	Pistachio ,, ,, ...	10	23
	42	1½	Walnut ,, ,, ...	6	27
Oatmeal ...			See Porridge.		
Okra	*68*	2⅓	As purchased	1	0
Olives ...	*125*	4½	Ripe	2½	50
	55	2	Green	½	11
Onions ...	*100*	3½	Boiled once	1	1½
	50	1¾	Raw	½	½
Oranges ...	*55*	2	With skin	½	0
	50	1¾	Without skin	½	0
	45 c.c.	1½	Juice	0	0
*Ovaltine ...	*7*	¼	As purchased	1	½

5 GRAMMES OF CARBOHYDRATE

are contained in—

	Gm.	Oz.	Remarks (how weighed, &c.).	And these amounts also contain grammes of— P.	F.
PARSNIPS ...	*250*	8¾	Boiled once	½	1
PEACHES ...	*83*	3	Fresh, whole	½	0
	46	1⅔	Tinned	½	0
	71	2½	Stewed without sugar ...	0	0
PEARS ...	*42*	1½	With skin	0	0
	38	1⅓	Without skin	0	0
	28	1	Tinned	0	0
	7	¼	Dried...	0	0
	71	2½	Stewed without sugar ...	0	0
PEAS, GREEN	*33*	1¼	Fresh, boiled once	2½	½
	30	1	Dried, ,, ,, ...	2	0
	50	1¾	Tinned	2	0
*PERSIMMON ...	*16*	½	As purchased	0	0
PICKLES ...	*119*	4	Mixed, unsweetened ...	1	½
*PINEAPPLE ...	*14*	½	Tinned	0	0
	55	2	Fresh, edible portion ...	½	0
PLUMS ...	*28*	1	,, with stones	0	0
	33	1¼	Stewed, without sugar ...	0	0
POMEGRANATE	*28*	1	As purchased	½	½
PORRIDGE ...	*7*	¼	Raw Oatmeal	1	1
(See also Quaker Oats)	*43*	1½	Boiled ,, ...	1	1
POTATO ...	*24*	¾	Boiled once, or raw... ...	½	0
	19	⅔	Baked in skin	½	0
	10	⅓	Chips, fried in fat	½	4
*PRUNES ...	*8*	¼	Dried...	0	0
	22	¾	Stewed	0	0
QUAKER OATS	*7*	¼	Weighed before cooking ...	1	½
	71	2½	Cooked	1	½
RADISHES ...	*100*	3½	Raw	1	0
*RAISINS ...	*7*	¼	Dried...	0	0
RASPBERRIES	*42*	1½	As purchased	½	0
REDCURRANTS	*71*	2½	,, ,, ...	½	0
RHUBARB ...	*170*	6	Stewed once, without sugar	0	0
	250	8¾	,, in two waters ,,	0	0
	143	5	Raw	½	½

5 GRAMMES OF CARBOHYDRATE

are contained in—

	Gm.	Oz.	Remarks (how weighed, &c.).	And these amounts also contain grammes of— P.	F.
*Rice	6	$\frac{1}{5}$	Raw	0	0
	20	$\frac{2}{3}$	Boiled once	$\frac{1}{2}$	0
*Sago	6	$\frac{1}{5}$	Uncooked	0	0
	50	$1\frac{3}{4}$	Boiled once	0	0
Salsify ...	53	$1\frac{3}{4}$	,, ,, ...	$\frac{1}{2}$	0
Sauerkraut ..	130	$4\frac{1}{2}$	As purchased	2	$\frac{1}{2}$
Sausage ...			See Protein section.		
Seakale ...	160	$5\frac{1}{2}$	Boiled once	$2\frac{1}{2}$	0
	250	$8\frac{3}{4}$	,, in two waters ...	$2\frac{1}{2}$	0
Sorrel ...	166	$5\frac{3}{4}$	,, once	$\frac{1}{2}$	0
Spinach ...	170	6	,, once	$3\frac{1}{2}$	$\frac{1}{2}$
	250	$8\frac{3}{4}$	,, in two waters ...	$3\frac{1}{2}$	$\frac{1}{2}$
Strawberries	62	$2\frac{1}{4}$	Fresh	$\frac{1}{2}$	0
*Sugar† ...	5	$\frac{1}{6}$	... ...	0	0
Swede ...	62	$2\frac{1}{2}$	Raw	$\frac{1}{2}$	0
*Tapioca ...	6	$\frac{1}{5}$	,, ...	0	0
	20	$\frac{2}{3}$	Boiled once	$\frac{1}{2}$	0
*Toast ...	8	$\frac{1}{4}$	(Generally should be avoided in diabetes)	$\frac{1}{2}$	0
Tomatoes ...	125	4	Raw, or cooked, or tinned ...	1	$\frac{1}{2}$
Truffles ...	84	3	Cooked	5	$\frac{1}{2}$
Turnips ...	250	$8\frac{3}{4}$	Boiled once, mashed ...	$1\frac{1}{2}$	0
Turnip Tops			See Greens.		
Vegetable Marrow			See Marrow.		
Watercress	100	$3\frac{1}{2}$	Raw, whole	3	$\frac{1}{2}$
	500	18	Boiled once	3	0
Whey	...100 c.c.	$3\frac{1}{2}$	... ...	1	$\frac{1}{2}$

† An average lump contains 5 grammes Carbohydrate.

Protein Foods (P.)

(MEAT, FISH, POULTRY, EGGS, &c.).

5 GRAMMES OF PROTEIN are contained in—	Gm.	Oz.	Remarks (how weighed, &c.).	And these amounts also contain grammes of— Fat.
Anchovies ...	*22*	¾	As purchased	½
Bacon ...	*28*	1	Average, fried	15
Beef	*20*	⅔	Average roast	5
	15	½	Roast, lean	3
	20	⅔	Steak, lean	2
	18	⅔	Boiled	4
	20	⅔	Corned	4
	20	⅔	Pressed	6
	100 c.c.	3½	Raw Beef juice	1
Bovril ...			See list of "Extras" (page 25).	
Brains ...	*55*	2	As purchased	5½
Caviare ...	*17*	½	„ „	3
Calf's Foot Jelly			See Carbohydrates.	
Cheese ...	*18*	⅔	Rough average	5
	17	½	American	5
	30	1	Brie	6½
	24	¾	Camembert	5
	19	⅔	Cheddar	5½
	19	⅔	Cheshire	5½
	20	⅔	Gorgonzola	6
	17	½	Gruyère	5
	17	½	Roquefort	5
Cheeses, Fatty ...	*20*	⅔	Full cream	8
	20	⅔	St. Ivel	7
	20	⅔	Stilton	7
Cheeses, Protein ...	*14*	½	Dutch	2
	12	⅓	Parmesan	2
Chicken ...	*20*	⅔	Average, roast or boiled	1½
Clams ...	*47*	1⅔	Raw, without shell	½

(1⅔-oz. Clams also contain 2 gm. C.)

5 GRAMMES OF PROTEIN

are contained in—

	Gm.	Oz.	Remarks (how weighed, &c.).	And these amounts also contain grammes of— Fat.
Cod	*23*	¾	Boiled	0
Crab	*30*	1	Edible portion	½
Crayfish ...	*30*	1	,, ,, ...	½
Duck	*18*	⅔	Average, roast	2
Eels	*30*	1	Cooked, edible portion	4
†Eggs	*14*	½	Hen's, dried, weighed before cooking	5½
			,, one average whole egg contains ... ... P. 6	5½
			,, the white of one average egg contains 3½	0
			,, the yolk of one average egg contains 2½	5½
			Duck's, one average whole egg contains 10½	10½
Egg Powder			See Carbohydrates.	
Fish			See under the various names.	
Fowl			See Chicken.	
Gelatine ...	*5*	⅙	As purchased	0
Goose ...	*20*	⅔	Roast	6
Grouse ...	*14*	½	Cooked	½
Guinea Hen	*21*	¾	,, ...	1
Haddock ...	*23*	¾	Boiled	0
	28	1	Smoked, boiled	0
Hake	*31*	1	Boiled	0
Halibut ...	*25*	¾	,, ...	1
Ham	*23*	¾	,, ...	5
	22	¾	Fried	7½
Hare	*10*	⅓	Cooked	0
Herring ...	*19*	⅔	Fresh, cooked	2
	24	¾	Salt, ,, ...	2½
Kidneys ...	*26*	1	Cooked	1½
Kipper ...	*28*	1	Boiled	2
Lamb	*22*	¾	Roast	2½
	23	¾	Chop, steamed	2½
Lemco ...			See list of "Extras" (page 25).	
Liver ...	*24*	¾	Cooked ... ... (¾-oz. Liver also contains 1 gm. C.)	2

†An average hen's egg with shell weighs 2-oz. An average duck's egg, 3-oz.

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5 GRAMMES OF PROTEIN

are contained in—

	Gm.	Oz.	Remarks (how weighed, &c.).	And these amounts also contain grammes of—Fat.
LOBSTER ...	*31*	1	Edible portion, fresh or tinned ...	½
MACKEREL ...	*30*	1	Boiled	2
MEAT... ...			See Beef, Mutton, &c.	
MULLET ...	*26*	1	Cooked	2
MUSSELS ...	*50*	1¾	Raw, without shell ... ... (1¾-oz. Mussels also contain 1½ gm. C.)	½
MUTTON ...	*19*	⅔	Roast	5
	17	⅔	Boiled	2
	20	⅔	Chop, lean, steamed	1
OXO			See list of "Extras" (page 25).	
OYSTERS ...	*71*	2½	Without shell ... ... (2½-oz. Oysters also contain 2½ gm. C.)	0
PÂTÉ DE FOIE GRAS	*36*	1⅓	As purchased ... ... (1⅓-oz. Pâté also contain 1 gm. C.)	13
PARTRIDGE ...	*14*	½	Cooked	0
PHEASANT ...	*14*	½	,, ...	0
PIGEON ...	*20*	⅔	,, ...	0
PIG'S FEET ...	*30*	1	Edible portion, cooked	8
PLAICE ...	*33*	1¼	Steamed	½
PORK	*15*	½	Roast	3
	20	⅔	Chop, lean, cooked	1
PRAWNS ...	*50*	1¾	As purchased	½
QUAIL ...	*22*	¾	Cooked	1½
RABBIT ...	*15*	½	Stewed	1
	11	⅓	Roast	1½
ROE	*23*	¾	Fish, steamed	1
SALMON ...	*25*	¾	Boiled	2½
	22	¾	Tinned	3
SANATOGEN ...	*6*	⅕	As purchased	0
SARDINES ...	*21*	¾	Tinned	4
†SAUSAGES ...	*38*	1⅓	Pure Pork, uncooked ... ... (1⅓-oz. Pure Pork also contain ½ gm. C.)	13½
	26	1	Bologna, ,, ...	5
	25	1	Frankfurt ,, ... (1-oz. Frankfurt also contains ½ gm. C.)	5
	50	1¾	Cambridge ,, ... (1¾-oz. Cambridge also contain 1 gm. C.)	15
SHRIMPS ...	*20*	⅔	Edible portion	0
	45	1½	As purchased	0

† Many sausages contain varying quantities of bread. Diabetics are therefore advised not to eat sausages.

5 GRAMMES OF PROTEIN are contained in—	Gm.	Oz.	Remarks (how weighed, &c.).	And these amounts also contain grammes of— Fat.
SKATE ...	*31*	1	Boiled	½
SMELTS ...	*31*	1	Cooked	½
SOLE	*31*	1	Steamed	0
SPRATS ...	*48*	1¾	Cooked	2½
STOCK ...	*83*	3	Clear...	1
SWEETBREADS	*26*	1	Cooked	½
TONGUE ...	*25*	¾	Ox, tinned	6½
	27	1	Ox, fresh, boiled	2½
	36	1¼	Sheep's, boiled	5½
TRIPE... ...	*30*	1	Boiled	2½
TROUT ...	*23*	¾	Cooked	½
TURBOT ...	*28*	1	Boiled	3½
TURKEY ...	*18*	⅔	Roast	2
TURTLE ...	*26*	1	Green	0
	83 c.c.	3	Soup, as purchased... ... ... (3-oz. Soup also contains 3 gm. C.)	1
VEAL	*15*	½	,, ...	2
	18	⅔	Cutlet, cooked	½
VENISON ...	*17*	⅔	Roast	½
WHITING ...	*29*	1	Steamed	0
WHITEBAIT ...	*48*	1¾	Cooked	2½

Fats† (F.).

5 GRAMMES OF FAT are contained in—	Gm.	Oz.	Remarks.
BACON FAT...	*6*	⅕	
BEEF FAT ...	*6*	⅕	
BUTTER ...	*6*	⅕	
CREAM ...	*29*	1	Average (20 per cent.).
	13	½	Thick (30–40 per cent.).
	8	¼	Clotted (Devonshire).
			Thin (see Carbohydrate list).
DRIPPING ...	*5*	⅙	
LARD... ...	*5*	⅙	

† Allowance should be made for any fat used in cooking.

5 GRAMMES OF FAT

are contained in—

	Gm.	Oz.	Remarks.
MARGARINE ...	6	$\frac{1}{5}$	Average.
MARROW, BEEFBONE	5	$\frac{1}{6}$	
MUTTON FAT	6	$\frac{1}{5}$	
OLIVE OIL ...	5	$\frac{1}{6}$	
SUET	5	$\frac{1}{6}$	

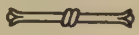
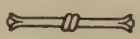


Table of Alcoholic Beverages.

WINES—	Percentage of Sugar, *i.e.*, Grammes of Sugar in 100 c.c. ($3\frac{1}{2}$-oz.).	Percentage of Alcohol, *i.e.*, Cubic Centimetres of Alcohol in 100 c.c. ($3\frac{1}{2}$-oz.).
BORDEAUX—		
Vin Ordinaire	0.1	7
Claret	0.2	9
Californian Claret	0.15	9
Grave	0.4	9
Sauterne, dry...	1.0	12
,, sweet	2.3	12
BURGUNDY—		
Average	0.2	11
Australian	0.3	11
Beaune	0.3	11
Californian	0.2	11
Chablis	1.2	9
Pommard	0.2	12
Champagne, dry	1.9	12
Hock	0.0	8
Italian, dry...	0.3	10
Madeira	2.0	15
Marsala	3.5	16
Moselle	0.25	8
Port...	6.8	17
Sherry, dry...	2.0	17
,, sweet	4.0	17

	Percentage of Sugar, *i.e.*, Grammes of Sugar in 100 c.c. (3½-oz.).	Percentage of Alcohol, *i.e.*, Cubic Centimetres of Alcohol in 100 c.c. (3½-oz.).
SPIRITS—		
Brandy, old	0	45
Gin, dry, pre-war	0	30
Rum, pre-war	0	43
„ Jamaica	0	69
Whisky, pre-war	0	40–45
„ post-war	0	20–25
LIQUEURS, &c.—		
Absinthe	0	45–55
Benedictine	33	40–50
Brandy	0	45
Chartreuse	34	43
Crême de Menthe...	28	48
Curaçao	29	30–45
Kümmel	31	35–55
Vermouth	9.5	14–16
BEERS, &c.—		
Ale, beer	4–8	4–5
Cider	0.7–2.0	5–6
Porter, stout	7	5

All sweet wines and liqueurs are forbidden for diabetics, and other alcoholic drinks should be taken only on the Physician's prescription.



Explanation and Use of the Tables.

When analysed chemically articles of diet may be found to consist of starchy or sugary material called Carbohydrate (C), meaty or fleshy material called Protein (P), and of Fat (F), together with water, salts, fibre, &c. The physician who is treating a diabetic has to calculate the sugar content (glucose equivalent), and the total fuel value (caloric value) of the diet he is prescribing. In this calculation he takes into account only the content of the diet in carbohydrate, protein, fat, and alcohol, and is not concerned with the water, salts, fibre, &c. Therefore the latter have been omitted from these tables. For example, it is stated on

page 8 that 100 c.c. or 3½-oz.* of milk contain 5 grammes of carbohydrate, 3½ grammes of protein, and 3½ grammes of fat. It is not stated that the remaining 88 grammes of the milk are made up of water, salts, &c. Similarly, 100 grammes or 3½-oz. of boiled onions contain 5 grammes of carbohydrate, 1 of protein, 1½ of fat, and 92½ of water, &c. Again, 20 grammes or ⅔-oz. of roast beef contain 5 grammes of protein, 5 of fat, 10 of water, gristle, &c., but no carbohydrate.

These points have been mentioned to make clear to the patient the relation between the physician's prescription of so many grammes daily of carbohydrate protein and fat, and the actual diet arranged. Thus, suppose a diet of 50 C., 100 P., and 150 F., were ordered, the doctor could, and sometimes does, detail the actual articles of food, with the amounts of each to be taken, making the necessary calculations himself. The difficulty is that no fixed menus will suit all tastes, all purses, and all seasons. He, therefore, usually leaves the calculations to the sister or to the patient, merely stipulating that the Carbohydrate must be taken in such and such a form (thus, in the above example, the 50 C., as 7-oz. milk and green vegetables, but in no other form; the 100 P. and 150 F., as any of the foods in the protein and fat lists).

The articles of diet have been grouped into three sections. Foods containing carbohydrate with or without protein or fat are placed in the carbohydrate section; foods containing protein with or without fat, but without carbohydrate, in the protein section; and foods with fat alone in the fat section. If, therefore, articles of diet are first selected from the carbohydrate list, secondly from the protein list, and thirdly from the fat list, the calculations become easy. As a rule it is best to divide the day's carbohydrate, protein, and fat approximately equally between the three or four meals. With the aid of the tables the correct quantities of the selected articles of diet are worked out for each meal.

In the carbohydrate section is given the amount of each food containing 5 grammes of carbohydrate, 5 grammes in our experience having been found the most convenient figure with which to work. The amount, if any, of protein or fat also contained in the given weight of food is listed in the last two columns. In the following examples such protein and fat is referred to as "incidental," because it is primarily the carbohydrate we are considering in this section. Similarly in the protein section is given the amount of each food containing 5 grammes of protein, the incidental fat being listed in the last column.

Two examples of how to calculate a day's diet from the physician's instructions are given below.

---

* 1-oz. = 28.4 grammes, and 1 fluid oz. = 28.4 c.c.

Calculation of a Diabetic Diet.

EXAMPLE I.

Physician's Instructions:—

	C.	P.	F.
Amount prescribed for the day in grammes	100	100	160

This amount to be equally divided into four meals, and bulky vegetables to be taken at each meal.

Allowance for each meal therefore = 25 C., 25 P., 40 F.

BREAKFAST—Allowance, 25 C., 25 P., 40 F.

First work out the *Carbohydrate.*—15 C. can be taken as porridge, weighed as $\frac{3}{4}$-oz. of raw oatmeal = 15 C., 3 P., 3 F; $3\frac{1}{2}$-oz. of milk = 5 C., $3\frac{1}{2}$ P., $3\frac{1}{2}$ F.; cabbage boiled in two waters, $8\frac{3}{4}$-oz = 5 C., $1\frac{1}{2}$ P., 0 F., making the required total of 25 C.

Next work out the *Protein.*—remembering that 8 P. have already been used as "incidental" protein contained in the carbohydrate foods. The remaining 17 P. can be taken as fried bacon, 2-oz. = 10 P., 30 F., and 1 egg = 6 P., $5\frac{1}{2}$ F.

Then calculate the *Fat.*—The incidental fat amounts to 42 F., and, as the allowance is only 40 F., no more fat remains to be given.

Thus breakfast consists of:—

	Oz.	Grammes of C.	P.	F.
Tea	—	0	0	0
Porridge, raw Oatmeal ...	$\frac{3}{4}$	15	3	3
Milk	$3\frac{1}{2}$	5	$3\frac{1}{2}$	$3\frac{1}{2}$
Cabbage, boiled in two waters	$8\frac{3}{4}$	5	$1\frac{1}{2}$	0
Bacon, fried	2	—	10	30
Egg, one, average	—	—	6	$5\frac{1}{2}$
		25	24	42

If porridge is not liked, 1-oz. of bread could be taken in its place.

DINNER—Allowance, 25 C., 25 P., 40 F.

The carbohydrate can be taken as Brussels sprouts, boiled once, 5-oz. = 5 C., 2 P.; bread, 1-oz. = 15 C., 3 P.; tomato, 4-oz. = 5 C., 1 P., $\frac{1}{2}$ F.

The protein remaining after deducting the incidental protein is 19 P., and can be taken as roast beef, 2-oz. = 15 P., 15 F., and Cheddar cheese, $\frac{2}{3}$-oz. = 5 P., $5\frac{1}{2}$ F.

The incidental fat is 21 F. The remainder can be taken as butter, $\frac{4}{5}$-oz. = 20 F.

Clear soup, of no food value, can be added if desired, making dinner as follows:—

	Oz.	Grammes of C.	P.	F.
Clear Soup	—	0	0	0
Roast Beef, average	2	0	15	15
Brussels Sprouts, two waters ...	5	5	2	0

	Oz.	Grammes of C.	P.	F.
Bread	1	15	3	0
Cheese, Cheddar	⅔	0	5	5½
Butter	⅘	0	0	20
Tomato	4	5	1	½
		25	26	41

TEA.—Allowance, 25 C., 25 P., 40 F.

The carbohydrate can be taken as bread, ⅔-oz.=10 C., 2 P.; cucumber, without skin, 5 oz.=5 C., 1 P.; lettuce, 6 oz.=5 C., 2½ P., ½ F.; milk, 3½-oz.=5 C., 3½ P., 3½ F.

The incidental protein=9 P. The remaining 16 P. can be taken as fried ham, 1½-oz.=10 P., 15 F., and one egg=6 P., 5½ F.

The remaining fat is 15½ F., to be taken as butter, ⅘-oz.=15 F. Thus, tea consists of :—

	Oz.	Grammes of C.	P.	F.
Tea	—	0	0	0
Milk	3½	5	3½	3½
Egg, one	—	0	6	5½
Ham, fried	1½	0	10	15
Bread	⅔	10	2	0
Cucumber, without skin ...	5	5	1	0
Lettuce, raw	6	5	2½	½
Butter	⅘	0	0	15
		25	25	39½

SUPPER.—Allowance, 25 C., 25 P., 40 F.

The carbohydrate can be taken as once-boiled French beans, 7-oz.=5 C., 1½ P.; boiled potato, 2¼-oz.=15 C., 1½ P., and raw celery, 5-oz.=5 C., 1 P.

The incidental protein is 4 P., leaving 21 P., to be taken as tinned salmon, 2¼-oz.=15 P., 9 F., and Cheshire cheese, ⅔-oz.=5 P., 5½ F.

The incidental fat=14½ F., leaving 25½ F. to be taken as butter, ⅘-oz.=15 F., and thick cream, 1-oz.=10 F. Thus, supper consists of :—

	Oz.	Grammes of C.	P.	F.
Salmon, tinned	2¼	0	15	9
Potato, boiled	2¼	15	1½	0
French beans, boiled once ...	7	5	1½	0
Cheese, Cheshire	⅔	0	5	5½
Celery, raw	5	5	1	0
Butter	⅘	0	0	15
Cream, thick	1	0	0	10
Coffee	—	0	0	0
		25	24	39½
Total for day		100	99	162

EXAMPLE 2.

Physician's Instructions:—

	Grammes of C.	P.	F.
Amount prescribed for the day	20	50	100
Allowance for Breakfast	5	15	30
,, ,, Lunch	7½	15	35
,, ,, Supper...	7½	20	35

The 20 grammes carbohydrate to be taken in the form of green vegetables or other bulky carbohydrate foods.

This is a much more restricted diet than the first example. Milk is omitted and replaced by cream. A few extras of no food value are used to increase the bulk of the diet. The allowance for each meal is not strictly adhered to, but the total for the day is as nearly exact as practicable.

BREAKFAST.—Allowance, 5 C., 15 P., 30 F.

First work out the carbohydrate, of which 5 grammes may be taken as 8¾-oz. of cabbage, boiled in two waters = 5 C., 1½ P. Now work out the protein, remembering that 1½ P. have already been taken as incidental protein in the cabbage. 13½ P. remains and can be taken as 1½-oz. of fried ham = 10 P., 15 F., and 1 average egg = 6 P., 5½ F., making so far a total of 17½ P., 20½ F. The protein allowance is thus slightly exceeded, and this will be rectified at another meal. Turning to the fat, we find that 20½ F. has been used as incidental fat, leaving 10 F. to be taken as 1-oz. of cream. Thus, breakfast consists of:—

	Oz.	Grammes of C.	P.	F.
Cabbage, boiled in two waters...	8¾	5	1½	0
Ham, fried	1½	0	10	15
Egg, one, fried with the ham ...	—	0	6	5½
Cream, thick	1	0	0	10
Tea	—	0	0	0
Bran biscuits	—	0	0	0
		5	17½	30½

LUNCH.—Allowance, 7½ C., 15 P., 35 F.

The carbohydrate can be taken as tomato, 4-oz. = 5 C., 1 P., ½ F., and raw celery, 2½-oz. = 2½ C., ½ P. The incidental protein = 1½ P.,

and the remaining 13½ P. can be taken as kidneys, fried, 2-oz.= 10 P., 3 F., and cheese, ⅔-oz.=5 P., 5 F. The incidental fat=8 F., leaving 28 F. to be taken as butter, 1-oz.=25 F. Or if preferred take only ⅘-oz. butter, thus leaving 5 F. for cream at tea-time. Thus lunch, with the addition of a few mushrooms of no food value is:—

	Oz.	Grammes of C.	P.	F.
Kidneys (fried in some of the butter)	2	0	10	3
Tomato (,, ,,)	4	5	1	½
Mushrooms, a few	—	0	0	0
Cheese	⅔	0	5	5
Celery, raw	2½	2½	½	0
Butter	1	0	0	25
Bran biscuits	—	0	0	0
		7½	16½	33½

TEA.—Some of the butter for lunch can be substituted by ½-oz. of cream for tea, as already mentioned; bran biscuits may be taken to make up bulk.

SUPPER.—Allowance, 7½ C., 20 P., 35 F.

We can begin with clear soup of no food value. The carbohydrate is taken as cauliflower, boiled in one water, 8¾-oz.=5 C., 1½ P., and tomato 2-oz.=2½ C., ½ P. Turning to the protein, we have used 2 P. as incidental protein, and 4 P. in excess at breakfast and lunch. This leaves 14 P. to be taken as roast chicken, 2-oz.=15 P., 4½ F. The incidental fat=4½ F., leaving 30 F. to be taken as butter, ⅖-oz.=10 F., and thick cream, 2-oz.=20 F. Thus, supper consists of:—

	Oz.	Grammes of C.	P.	F.
Clear soup	—	0	0	0
Chicken, roast	2	0	15	4½
Cauliflower, once boiled ...	8¾	5	1½	0
Tomato	2	2½	½	0
Butter, melted	⅖	0	0	10
Agar jelly	—	0	0	0
Cream, thick	2	0	0	20
Coffee	—	0	0	0
		7½	17	34½
Total for the day		20	51	98½

Notes.

Scales and Measures.

A convenient form is known as "confectionery scales," and together with a set of weights ($\frac{1}{4}$-oz. to 1-lb.) may be purchased for about £2 (1924). It is simpler as well as more accurate to weigh and work in grammes throughout rather than in ounces and fractions thereof. Weights of from 1 to 500 grammes would be required. When cleaning scales or weights never use metal polish, but a duster or soap and water.

For measuring fluids a 2-oz. medicine glass or a 50 to 100 c.c. measuring cylinder is useful.

The Cooking of Vegetables.

Vegetables are a very important item in the diabetic diet because they contain only a small amount of carbohydrate in a large bulk of food, and this small amount is slowly digested and absorbed. It can, therefore, be more successfully utilised by the diabetic organism than quickly absorbed carbohydrates like bread and sugar. The longer vegetables are cooked in water the more carbohydrate is extracted from them, and some can be freed altogether by prolonged boiling in several changes of water. Thus their carbohydrate value depends on the method of cooking, and in the tables we have indicated how each vegetable is cooked. Unfortunately the carbohydrate content of cooked vegetables, as analysed by different authorities, varies greatly, probably largely on account of different methods and times of cooking.

The following are the different ways of cooking vegetables for diabetics:—

I. Boiling in One Water.—The vegetables are cooked for the usual time as in ordinary domestic cooking. They must be covered with water and not merely steamed. In fact it is best to cut solid vegetables into small slices and soak them in cold water before boiling, thereby increasing the extraction of starch.

II. Boiling in Two Waters.—The vegetables, if solid, are cut into small slices, covered with water, and boiled for 15–20 minutes. The water is strained off and fresh water is added; the vegetable is again boiled for 15–20 minutes and is then served. Much of the carbohydrate is extracted by this procedure.

III. Boiling in Three Waters.—Same as II., but the water is changed thrice.

IV. Carbohydrate-free Vegetables.—
It is sometimes an advantage to be able to prepare vegetables free from carbohydrate and of no food value, which can be used to add to the bulk of the diet to appease hunger. This can be done in two ways:

(a) Repeated Boiling in Different Waters.*—
The same procedure is followed as in II., but the water is changed every 15–20 minutes until all the carbohydrate is extracted. Different vegetables require different numbers of changes of water as follows:—

Vegetable.	No. of boiling waters required.
Artichoke	2
Celery	3
Spinach	4
Rhubarb	5
Carrots, turnips, kale	6
Cabbage and cauliflower	never freed.

The frequent boilings make the vegetables somewhat tasteless. This is avoided to some extent in the second method.

(b) Repeated Extraction with Water at 140°F. (60°C.).*—
The vegetable is sliced finely and covered with water at 140°F. It is allowed to stand for 10–15 minutes in which time it cools to about 105°F. (40°C.). The water is drained off and more water at 140°F. is added. The process is repeated until all the carbohydrate is extracted. This requires a different time for different vegetables. Unfortunately the time has so far been determined for only a few vegetables.

Vegetable.	Time required to free from carbohydrate with extractions at 140°F.
Beetroot and parsnip ...	1 hour.
Carrot	1½ ,,
Egg plant	2 ,,
Pineapple	3½ ,,
Cabbage	never freed.

* R. A. Wardall. J. Amer. Med. Assoc., 1917. December 1, page 1859.

Preparation of Bran Biscuits.

BRAN BISCUITS may be taken as desired instead of bread; they are useful to keep the bowels regular. They are made as follows:—

½-lb. of bran (from a corn shop).

1 pint of water.

½-oz. of agar-agar fibre (from chemist; cost 6d. to 8d. per oz.).

Salt, if desired.

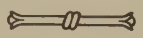
Put bran into a muslin bag and tie the bag on the cold tap, taking care that all the bran is completely immersed.

Wash for 2 hours or more, kneading occasionally, until the water comes through absolutely clear. Then place the bag in boiling water for 1½ hours, or longer, and finally wash on the cold tap again for a half to 1 hour. (Do not attempt to wash more than ½-lb. of bran at a time).*

Melt the agar-agar in the pint of water by boiling slowly. Stir in thoroughly the washed bran and the salt. Turn out into a tin, or pie dish, and leave until set.

Cut up into *thin* biscuits and bake *very slowly* until crisp—about 1½ hours. Keep the stock of biscuits in a tin. Warm until crisp just before serving.

If the above details are strictly complied with, the bran biscuits are starch-free and "food valueless."



Special Points to be Observed by the Diabetic.

1.—As far as possible divide up evenly between the three or four meals of the day the amount of carbohydrate, protein, and fat prescribed. Allow an interval of, at least, 3½ hours between two consecutive meals.

2.—If possible, always give some green vegetables, or bulky carbohydrate food with each meal, especially if foods rich in carbohydrate (e.g., bread) are being allowed.

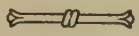
3.—To ensure sufficient vitamins, butter should be used in preference to margarine, raw lemon or lemon juice should be taken occasionally if other fresh fruits are forbidden, and marmite may be used for flavouring.

---

* Bran may be kept for a long time, after it has been freed from starch by the washing, if it is at once thoroughly dried in the oven or in the sun. Moist bran may soon (in one or two days) become foul owing to the growth of fungi.

4.—Fluids are usually permitted *ad lib.*, but beware lest the habit be developed of drinking merely to "fill the stomach," as this of itself may cause inconveniently large quantities of urine to be passed, although the urine is sugar-free.

5.—Alcohol should be avoided unless specially prescribed by the physician.



Foods allowed during "Starvation."

Water, *ad lib.*

Soda water (unsweetened), *ad lib.*

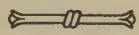
Weak tea (no sugar, no milk), in moderation.

Weak coffee (no sugar, no milk), in moderation.

Alcohol, in form of whisky or brandy, few ounces (1 to 4) daily, if specially prescribed.

Thin clear soups and broths, in moderation—e.g., beef tea or chicken broth. N.B.—Flour, &c., must never be added for thickening.

Bovril, Oxo, or Lemco, in small quantities, up to ½-oz. per diem.

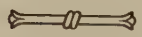


"Extras" of "No Food Value."

For practical purposes the following may be regarded as of no food value if taken in moderate quantities:—

Food.	Remarks.	Grammes of C.	P.	F.
Weak tea	No sugar, no milk.			
Weak coffee... ...	No sugar, no milk.			
Alcohol, as whisky or brandy.	1-oz. to 4-oz. daily.			
Thin clear soups and broths—e.g., beef tea, chicken broth, &c.	Thickening agents (flour, &c.) must not be added.			
Bovril	⅓-oz. really correspond to	0	1	0
Oxo	⅕-oz. „ „	0	1	0
Lemco	⅕-oz. „ „	0	1	0
Lemon juice... ...	1-oz. „ „	1	0	0
Horseradish	¼-oz. „ „	1	0	0
Mixed pickles, unsweetened ...	1-oz. „ „	1	0	0

Food.	Remarks.
Vinegar	In small amount.
Mushrooms	In small quantities.
Bran	Must be very well washed under tap. (See note on Bran Biscuits).
Agar-agar	Used in preparation of bran biscuits, jellies, marmalade, &c.
Gelatine	A very small amount is used in the special jellies allowed.
Saccharin	To sweeten foods or drinks; not more than 3 grains allowed daily; when cooking add the saccharin at the end of the period of heating.
Liquid Paraffin (medicinal)	Used in frying and to make salad dressings, &c.
Mustard or pepper ...	In very small quantities.
Salt	In moderation, for fear of dropsy; use pure crystallized kitchen salt.
Flavouring materials	Almonds, Essence of. Brandy. Cloves. Coffee. Lemon Juice, Lemon Peel. Orange Peel. Parsley. Sage. Vanilla. Whisky.

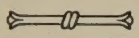


Forbidden Foods.

The following should be avoided entirely by the diabetic unless special permission to the contrary be given by the physician:—

Food.	Reasons for Avoiding.
Sugars	
All sweetened drinks (ærated waters, &c.)	Variable content of sugar.
All wines, spirits, liqueurs, and other alcoholic beverages, except whisky and brandy	Variable content of sugar.
Jams, marmalade, honey, syrups, treacles, and chocolate	Large proportion of sugar.

Food.	Reasons for Avoiding.
Most jellies, as purchased	Variable content of sugar.
Cakes, flours, and pastries	Very high carbohydrate content.
Most puddings, tarts, and pies ...	Very high carbohydrate content.
Milk puddings, rice, sago, tapioca, arrowroot, barley, &c.	Very high carbohydrate content.
Blancmange and custard powders ...	Very high carbohydrate content.
Batter	Very high carbohydrate content.
Biscuits	Very variable and high carbohydrate content.
Benger's Food, &c.	Very high carbohydrate content.
All thick soups	Thickened with flour, &c.
Grapenuts, Force, Shredded Wheat...	High carbohydrate content.
Sausages	Variable amount of bread present.
Nuts	Indigestible, concentrated, often very rich in fat.
Most fruits, especially when ripe ...	Often contain sugar; may be allowed if carbohydrate tolerance high.
Most "diabetic foods" (e.g., gluten breads)	Many contain starch; composition often not known.



Calculation of the Calorific Value of a Diet.

1 gramme of Carbohydrate = 4.1 Calories.
1 ,, Protein ... = 4.1 ,,
1 ,, Fat ... ... = 9.3 ,,

Suppose, for example, the diet prescribed contains 100 grammes of Carbohydrate, 100 grammes of Protein, and 100 grammes of Fat. The total gross Calories per diem would, therefore, be 1,750—

100 grammes of Carbohydrate	=	410	Calories.
100 ,, Protein ...	=	410	,,
100 ,, Fat ...	=	930	,,
Total	=	1,750	,,

Suppose, further, that the patient's body weight be 70 kilogrammes. The Calories per kilogramme would then be—

$$\frac{1{,}750}{70} = 25.$$

If Alcohol is permitted the additional Calories taken in this form must be calculated—

1 gramme of Alcohol = 7 Calories.
1 c.c. ,, = 5.6 ,,

It is to be noted that up to 10 per cent. of the Calorific value of the diet may be lost in the fæces.

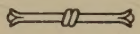


Table of Equivalents.

1-oz.	corresponds to	28.4 grammes.
1-lb.	,,	0.4536 kilogrammes.
1-stone	,,	6.35 kilogrammes = $6\frac{1}{3}$ kilogrammes (approx.).
11-stone	,,	70 kilogrammes (approx.).
1 fluid oz.	,,	28.4 c.c.
1-pint	,,	568 c.c. (approx.).
100 grammes	,,	$3\frac{1}{2}$-oz. (approx.).
100 c.c.	,,	$3\frac{1}{2}$ fluid oz. (approx.).
1 litre (1,000 c.c.)	,,	35 fluid oz. (approx.) = $1\frac{3}{4}$-pints.

1 new penny weighs $\frac{1}{3}$-oz. 1 new halfpenny weighs $\frac{1}{5}$-oz.

13.D.142.
Food tables; compiled particula1924
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